IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

APPLERA CORPORATION, MDS INC., and APPLIED BIOSYSTEMS/MDS SCIEX INSTRUMENTS, *Plaintiffs*, v. THERMO ELECTRON CORPORATION, *Defendant*.	C.A. No. 04-1230-GMS
THERMO FINNIGAN LLC, *Plaintiff*, v. APPLERA CORPORATION, MDS INC., and APPLIED BIOSYSTEMS/MDS SCIEX INSTRUMENTS, *Defendants*.	C.A. No. 05-110-GMS

AB/SCIEX'S ANSWERING CLAIM CONSTRUCTION BRIEF

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Applera Corporation, MDS Inc., and Applied Biosystems/MDS Sciex Instruments (collectively, "AB/Sciex") submit this answering brief in response to the opening claim construction brief of Thermo Electron Corporation and Thermo Finnigan LLC (collectively, "Thermo"). D.I. 58 (C.A. No. 04-1230); D.I. 47 (C.A. No. 05-110).

SUMMARY OF ARGUMENT

As AB/Sciex stated in its opening brief, Thermo's proposed constructions do not comply with Federal Circuit precedent. On the one hand, Thermo seeks to narrow the scope of AB/Sciex's '736 patent by limiting it to the preferred embodiments, distorting MDS's arguments during the reexamination, and challenging several of the Court's constructions from the Micromass case. On the other hand, Thermo does an about face with respect to its own '784 patent, seeking to enlarge its scope by relying on dictionary definitions that are inconsistent with the teachings of the specification. AB/Sciex's proposed constructions comply with Federal Circuit precedent and are consistent with the teachings of the specifications of both patents. They should be adopted.

RESPONSE TO THERMO'S STATEMENT OF FACTS

AB/Sciex disagrees with several aspects of Thermo's presentation of the technical background of mass spectrometry and the two patents in suit. Thermo Br. 1-22.[1] To the extent that those disagreements bear on any of the claim constructions at issue, AB/Sciex will address them in the context of these constructions. However, one element of Thermo's presentation requires a response here.

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[1] "Thermo Br. __" refers to Thermo's Opening Markman Brief. D.I. 58 (C.A. No. 04-1230); D.I. 47 (C.A. No. 05-110).

Thermo's dismissively characterizes the work of inventors Dr. Douglas and Dr. French as the "alleged" invention of the '736 patent and the phenomenon of collisional focusing in an ion guide as something they "claim to have discovered." Thermo Br. 15-16. Although it is typical for a defendant to belittle the invention of the patent it is accused of infringing, Thermo has no basis to do so here. The validity of the '736 patent was thoroughly tested in the Micromass litigation. Micromass had the incentive and the resources to bring forward all evidence it could find in support of its contention that the '736 patent is invalid. The jury and the court rejected Micromass's challenge because it flew in the face of irrefutable evidence that the Douglas and French invention was a groundbreaking development in the field of mass spectrometry.

Thermo also downplays the outcome of the Micromass litigation, stating that "AB/Sciex prevailed [at trial] on certain issues, and lost on others, but obtained a jury verdict against Micromass." Thermo Br. 19. In fact, AB/Sciex prevailed on every single issue except willfulness. After a ten-day trial, the jury found that both versions of Micromass's Quattro Ultima instrument infringed each asserted claim. *See Applera Corp. v. Micromass UK Ltd.*, 204 F. Supp. 2d 724, 729 (D. Del. 2002) (JA534)[2]. The jury also rejected all of Micromass's various invalidity challenges, finding that Micromass had failed to prove anticipation by prior art, prior public use, prior on sale, obviousness, lack of enablement, failure to disclose the best mode, and lack of written description support. *Id.* n.3. The jury awarded AB/Sciex damages of $47.5 million. *Id.* at 730 (JA535). The Court rejected all of Micromass's post-trial challenges to the infringement, validity, and damages verdicts after a thorough and rigorous analysis. *See*

[2] "JA __" refers to the Joint Claim Construction Appendix for U.S. Patent Nos. 4,963,736 and 6,528,784. D.I. 57 (C.A. No. 04-1230); D.I. 46 (C.A. No. 05-110).

id. at 747-58 (JA552-63), 770-82 (JA575-87). After a separate bench trial, the Court also rejected Micromass's inequitable conduct and equitable estoppel defenses. *Id.* at 758-70 (JA563-75). The Federal Circuit affirmed every aspect of the judgment "on the basis" of the Court's *Markman* and post-trial opinions. *Applera Corp. v. Micromass UK Ltd.*, 60 F.App'x 800 (Fed. Cir. 2003) (JA590).

Thermo also attempts to denigrate the Court's claim construction effort in the Micromass case by arguing that certain of those constructions "were incorrect, in many cases because basic technical concepts were not explained to the Court by the parties." Thermo Br. 20. That is not true. The Court arrived at its claim construction after a thorough and rigorous analysis following a full round of briefing and a four-hour hearing. The parties thoroughly explained the "basic technical concepts" underlying the patented technology to the Court not only in the briefs and at that hearing, but also in the video tutorials they submitted before the hearing. *See, e.g.*, D.I. 72, 73, 126, 130, 149, 150, 169, *Applera Corp. v. Micromass UK Ltd.*, C.A. 00-105-RRM (D. Del.).

ARGUMENT

I. DISPUTED CLAIM TERMS FOR AB/SCIEX'S '736 PATENT

A. "Separated By"

'736 Term	Claims	AB/Sciex's Proposal	Thermo's Proposal
"first and second vacuum chambers separated by a wall . . . an interchamber orifice located in said wall" (claim 1) "first and second spaces . . . separated by an interchamber orifice" (claim 14)	1, 14	"Separated by a wall" means at least a wall between the first and second vacuum chambers. "Interchamber orifice" means an orifice in a wall between the first and second vacuum chambers.	"First and second vacuum chambers separated by a wall" means that a wall defines a common boundary of each of the first and second vacuum chambers. "An interchamber orifice located in said wall" means an opening in the wall that connects the first and second vacuum chambers. "First and second spaces . . . separated by an interchamber orifice" means that an opening is located at a common boundary of each of the first and second spaces.

In seeking to substitute its proposed constructions for those of the Court in the Micromass litigation, Thermo ignores a critical point. The Federal Circuit reviewed and affirmed the Court's constructions of "separated by a wall" and "separated by an interchamber orifice." Before the Federal Circuit, Micromass made the same argument that Thermo is making here, albeit using a different analogy from the one Thermo uses (*i.e.*, "Illinois does not 'separate' New York and California"):

> Further, the phrase *separated by a wall* itself requires a single wall. For example, if someone were to say that "the Judge's chambers and his secretary's office are *separated by a wall*," then everyone would understand that the chambers and the office are next to each other and there is a single wall between them. On the other hand, "Courtrooms 201 and 203 are *separated by a wall*," is literally incorrect because there are several walls and a hallway between the two courtrooms. **Thus, the ordinary meaning of *separated by* requires a single wall, because if there were two or more walls, none of them would *separate* the first and second vacuum chambers.**

B23[3] (italicized emphasis original; bolded emphasis added); *cf.* Thermo Br. 26-27.

The Federal Circuit rejected that argument and "affirmed on the basis of" the Court's opinion (*Applera*, 60 F.App'x at 800 (JA590)), the same opinion that Thermo challenges as having "misconstrued this issue." Thermo Br. 27 n.7. Thermo attempts to rationalize why the Court previously rejected the same constructions it proposes, stating that Micromass "did not meaningfully discuss or explain the issue," and "devoted its energy to other claim terms." *Id.* at 26-27 n.7. On the contrary, at the *Markman* hearing, Micromass explained the issue the same way Thermo does here, employing a similar analogy:

> First and second vacuum chambers separated by a wall containing an interchamber orifice. Separated by, not just separated. If I were to say to

[3] "B__" refers to the Appendix to AB/Sciex's Answering Claim Construction Brief being filed herewith.

> somebody that President Bush's Oval Office is separated from his secretary by a door, everybody would know what separated means. It means that there's a door between President Bush and his secretary's office. They are next to each other. But if I were to say that this courtroom is separated from the Oval Office by that door (indicating), people would say I was nuts.

B28.

Had the Federal Circuit agreed with Micromass's (and Thermo's) argument, it would have reversed the judgment of infringement because the accused Micromass instruments had an additional vacuum chamber, rod set, and wall between the "first and second vacuum chambers," just as the accused Thermo instruments do here. Under the doctrine of *stare decisis*, the construction implicitly adopted by the Federal Circuit is binding on this Court. *See Burke, Inc. v. Bruno Indep. Living Aids, Inc.*, 183 F.3d 1334, 1341-42 (Fed. Cir. 1999); *Tate Access Floors, Inc. v. Interface Architectural Res., Inc.*, 185 F. Supp. 2d 588, 595 n.4 (D. Md. 2002); *Wang Labs., Inc. v. Oki Elec. Indus. Co.*, 15 F. Supp. 2d 166, 176 (D. Mass. 1998).

The Court and the Federal Circuit rejected Thermo's argument because it divorces the term "separated by" from the context of the claim. The phrases "separated by *a* wall" and "separated by *an* interchamber orifice" appear in claims that define the invention as "comprising," *i.e.*, as including but not being limited to, certain elements or steps. Thermo focuses its attention on the term "separated by" and glosses over the significance of the use of the indefinite articles "a" and "an." It is well established that in a patent claim defining an invention as comprising certain elements, the indefinite articles "a" or "an" mean "one or more" and, thus, *at least* the recited item is encompassed. The Federal Circuit articulated this rule in *KCJ Corp. v. Kinetic Concepts*, 223 F.3d 1351, 1356 (Fed. Cir. 2000), stating:

> This court has repeatedly emphasized that an indefinite article "a" or "an" in patent parlance carries the meaning of "one or more" in open-ended claims containing the transitional phrase "comprising." Unless the claim is specific as to the number of elements, the article "a" receives a singular interpretation only in rare circumstances when the patentee evinces a clear intent to so limit the article. *Under this conventional rule, the claim limitation "a," without more, requires at least one.*

(Emphasis added; citations omitted).

The Federal Circuit recently reiterated this rule in *Free Motion Fitness, Inc. v. Cybex Int'l*, 423 F.3d 1343, 1350, 1353 (Fed. Cir. 2005). There, the court reversed a grant of summary judgment of non-infringement in part on the basis that the district court had erred in construing the phrase "a cable linking a first extension arm and a second extension arm to the resistance assembly" to require that a single cable do the linking. The Federal Circuit noted that the district court had reached its construction "by pointing to the patents' numerous references to a single cable ('a cable linking' and 'the cable') and inferring from the patents' use of the plural in other instances 'that if the patent [sic] intended more than one cable, it would have expressly indicated that by using a plural term.'" *Id.* at 1350 (citation omitted). Quoting its statement of the rule in *KCJ*, the Federal Circuit rejected the argument that the specification limited the phrase "a cable" to a single cable, stating: "The references to a single cable in the specification are found in the description of the *preferred embodiments*, and do not evince a clear intent by the patentee to limit the article to the singular." *Id.* (emphasis added).

Under the rule applied in *KCJ* and *Free Motion*, the phrase "first and second vacuum chambers separated by a wall" means separated by *at least* a wall, as the Court and the Federal Circuit correctly concluded in the Micromass litigation. The phrase need not say "separated by a wall *and other structures*" in order to encompass that variation, as

Thermo contends. Thermo Br. 29. The phrase at issue in *Free Motion* – "a cable linking a first extension arm and a second extension arm to the resistance assembly" – can be transposed to recite, equivalently: "first and second extension arms linked by a cable to the resistance assembly." Presumably, Thermo would not contend that this phrase would need to say "linked by a cable *and other structures*" to embrace that variation, since the Federal Circuit held otherwise. The phrase "first and second vacuum chambers separated by a wall" merits no different treatment.

Thus, Thermo's analogy – "Illinois does not 'separate' New York and California" (*id.* at 26) – it is inapt here. To borrow from Thermo's analogy, in "patent parlance," a claim reciting "a country comprising New York and California separated by a state" would encompass the United States. That is because under the rule applied in *KCJ* and *Free Motion*, the phrase "a country comprising New York and California separated by a state" and the phrase "a country comprising New York and California separated by *at least* a state" are the same.[4]

The use of the term "interchamber" to describe the orifice in the wall does not limit the phrases "separated by a wall" or "separated by an interchamber orifice" to the presence of a wall and nothing else between first and second vacuum chambers as Thermo contends. *Id.* at 27. Although the prefix "inter" means "between," it does not follow that "in this context, 'between' means 'connecting,'" as Thermo asserts. *Id.* The

[4] Thermo's citation to *Spectrum Int'l v. Sterilite Corp.*, 164 F.3d 1372, 1380 (Fed. Cir. 1998) for the proposition that "'comprising' is not a weasel word with which to abrogate claim limitations" is inapposite. Thermo Br. 29. In *Spectrum*, the Federal Circuit held that the open-ended term "comprising" did not permit the claim to cover additional structures that had been specifically disclaimed during prosecution. 164 F.3d at 1379-80. This principle has no application here, because no prior art was distinguished during prosecution on the basis that the claims required that the first and second vacuum chambers to be separated only by a wall.

dictionaries that Thermo cites define "between" as "in an intermediate position in relation to two other objects" (TA174)[5], or "in an intermediate space or interval" (TA153), or "[i]ntermediate in the space separating two places or things" (TA136). Being in an intermediate position is not the same as connecting. To borrow from Thermo again, Illinois is between New York and California, but it does not connect them. The term "interchamber" limits the orifice to one that is an intermediate position in relation to two chambers, but the orifice need not connect the first and second vacuum chambers.

The fact that the preferred embodiments described in the specification have only a wall separating the first and second vacuum chambers (Thermo Br. 28) does not evince an intent to limit "a wall" to only a single wall. As the Federal Circuit stated in *KCJ*, "standing alone, a disclosure of a preferred or exemplary embodiment encompassing a singular element does not disclaim a plural embodiment." 223 F.3d at 1356. *See also Free Motion*, 423 F.3d at 1350. Although the specification states in reference to the preferred embodiment of Figure 1 that "vacuum chamber 30 is connected by an interchamber orifice 34 in a separator plate 36 to a second vacuum chamber 38" (JA17, 4:24-26), the claims, in contrast, do not use the terms "connected" or "separator plate." This contrast in language supports the conclusion that the claimed "interchamber orifice" is not limited to an orifice that "connects" the first and second vacuum chambers and that the phrase "separated by a wall" does not limit the claims to first and second vacuum chambers separated by only a wall. *See, e.g., Home Diagnostics, Inc. v. Lifescan, Inc.*, 381 F.3d 1352, 1357-58 (Fed. Cir. 2004) (rejecting district court's claim construction which improperly limited "the broader claim language" based on the preferred

[5] "TA __" refers to the Appendix to Thermo Electron Corporation's and Thermo Finnigan LLC's Opening Markman Brief. D.I. 59 (C.A. No. 04-1230); D.I. 48 (C.A. No. 05-110).

embodiments); *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054 (Fed. Cir. 1994).

Thermo's argument that "separated by a wall" must mean separated nothing more than a single wall because otherwise the phrase would be have no meaning is flawed. Thermo Br. 30. Thermo misinterprets the dictionary definitions of the term "chamber" it cites. A "chamber," according to the first of the two definitions Thermo quotes, is a "a natural or artificial enclosed *space* or cavity." TA154 (emphasis added). A chamber or *space* can be called out in a claim separately from the wall, walls or other structure that enclose it – *or the walls need not be called out at all. See, e.g., Rambus Inc. v. Infineon Techs. AG*, 318 F.3d 1081, 1093 (Fed. Cir. 2003) (holding that a claim need not recite every component necessary to enable a working device). Thus, in the phrase "first and second vacuum chambers" the walls or other structure that enclose the chambers are not called out, and the additional phrase "separated by a wall" can refer to a wall that is a common boundary of both chambers, or a wall that is a boundary of one of the chambers but not the other, or a wall that is between but is not a boundary of either chamber.

The Federal Circuit's decision in *Phillips* does not undermine its own affirmance of the Court's construction in the Micromass litigation. As Thermo points out, the Federal Circuit expressed concern with the use of dictionary definitions to "extend patent protection beyond what should properly be afforded by the inventor's patent." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1322 (Fed. Cir. 2005). The Court's construction of "separated by a wall" in the Micromass litigation was not based on dictionary definitions. *Applera Corp. v. Micromass UK Ltd.*, 186 F. Supp. 2d 487, 510 (D. Del. 2002), *aff'd*, 60

F.App'x 800 (Fed. Cir. 2003) (JA508). It was based on the principles discussed above, which remain unchanged by *Phillips*.

B. "Means for Generating Ions of a Trace Substance to be Analyzed"

'736 Term	Claim(s)	AB/Sciex's Proposal	Thermo's Proposal
"means for generating ions of a trace substance to be analyzed"	1	The corresponding structure, material, or acts described in the specification is an electric discharge needle, electrospray source or other ionization source operating at approximately atmospheric pressure.	The corresponding structure is an electric discharge needle, electrospray source, or other ionization source operating at approximately atmospheric pressure that is not after-developed technology.
"trace substance"	1, 14	No construction needed.	Matter that is present in a small amount or as a small fraction of a sample.

Thermo identifies three differences between the parties' proposed constructions.

(1) AB/Sciex's proposed construction includes the statutory language "corresponding structure, material, or acts" from 35 U.S.C. § 112, ¶ 6, rather than only the language "corresponding structure" as proposed by Thermo.

(2) Thermo's proposed construction adds a non-statutory phrase to exclude "after-developed technology."

(3) AB/Sciex and Thermo disagree on whether a separate construction for "trace substance" is required, and to extent that a separate construction is necessary, disagree on the proper construction.

With respect to the first disagreement, Thermo contends that the term "acts" should be omitted from the claim construction because "acts" correspond only to step-plus-function elements under 35 U.S.C. § 112, ¶ 6. AB/Sciex agrees that "acts" correspond only to step-plus-function elements. However, the phrase "corresponding structure, material, or acts" comes right out of the statute, will not confuse the jury, and should be included, as it was in the Court's constructions of "means" limitations in the Micromass case. *See, e.g., Applera*, 186 F. Supp. 2d at 516 (JA514), 530 (JA528).

With respect to the second disagreement, Thermo argues that the additional

phrase "that is not after-developed technology" is "needed in the construction itself because the term 'other ionization source' is itself so broad." Thermo Br. 32. This statement is neither true nor a justification. Both parties' proposed constructions make clear that the "other ionization source" is limited to an ionization source "operating at approximately atmospheric pressure," as set forth in the specification. JA17, 4:4-16. Therefore, including such a statement would be both unnecessary and confusing to a jury, especially because Thermo does not contend that any of its accused instruments do not literally satisfy this limitation because they use "after-developed technology." *See* B30-33 (interrogatory response in which Thermo's non-infringement contentions do not even address the "means for generating" limitation).

With respect to the third disagreement, AB/Sciex believes that the term "trace substance" requires no separate construction because the ordinary meaning is self-evident. *See, e.g., Phillips*, 415 F.3d at 1314. Although the term "trace substance" is not found in any of the dictionaries that AB/Sciex has reviewed, the synonymous term "trace element" is. Indeed, Thermo cites to the following definition of "trace element": "[a]n element found in small quantities (usually less than 1.0%) in a mineral." Thermo Br. 33 (citing TA147). Other dictionaries contain similar definitions of "trace element": "a chemical element (as zinc, boron, or iodine) found combined in minute quantities in plant or animal tissues and considered essential in the physiological processes of most plants and animals" (TA183); "[a] chemical element that occurs in minute quantities in a substance" (TA133). Based on these definitions of "trace element," the ordinary meaning of "trace substance" is simply "a small amount of material that is present in a larger

amount of material." To the extent that the Court concludes that the term "trace substance" should be construed, it should adopt this ordinary meaning.

The specification uses this ordinary meaning, which demonstrates that this is how one of ordinary skill in the art would understand the term. The specification states that "a sample gas or liquid *containing a trace substance to be analyzed* is introduced from supply chamber 12 via a duct 14 to an ionization chamber 16 which is fitted with an electric discharge needle 18 or other means of producing gaseous ions of the trace substances (e.g. electrospray)." JA17, 4:7-13 (emphasis added). Thus, the trace substance to be analyzed is found within a larger sample.

Thermo's proposed construction includes two alternative definitions: "Matter that is present in a small amount *or* as a small fraction of a sample." D.I. 64, Ex. A at 3 (emphasis added). Although the second alternative – "[m]atter that is present . . . as a small fraction of a sample" – is consistent with the ordinary meaning of "trace substance" proposed by AB/Sciex, the first alternative – "[m]atter that is present in a small amount" – is not because it is inconsistent with the ordinary meaning and the specification. This aspect of Thermo's definition reflects only its cited definitions of "trace,"[6] not its cited definition of "trace element." But as these definitions make clear, "trace" and "trace substance" are not the same thing. "Trace" refers to a small amount of material in absolute terms, whereas "trace substance" and "trace element" both refer to a small amount of material that is present in a larger amount of material.

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[6] Thermo cites to the following definitions of "trace": "[a]n extremely small but detectable quantity of a substance" (TA147); "a very small quantity of a chemical constituent or component esp. when not quantitatively determined because of minuteness" (TA183); "[a]n extremely small amount . . . [or, a] constituent, as a chemical compound or element, present in quantities less than a standard limit" (TA133). Thermo Br. 33.

Thermo does not point to anything beyond its dictionary definitions of "trace" to support this aspect of its proposed construction. Thermo cites passages from the specification which use the term "trace substance," including the passage set forth above, but these passages make it clear that the "trace substance" to be analyzed by the mass spectrometer system is found within a larger sample or compound. Thermo Br. 34 (citing JA16, 1:15-18; JA17, 4:7-13).

Finally, AB/Sciex's proposal is supported by relevant extrinsic evidence in this field. For example, a Supplement to the *Journal of American Society for Mass Spectrometry* entitled "What is Mass Spectrometry?" explains that mass spectrometry is a powerful analytical technique because "[d]etection of compounds can be accomplished with very minute quantities" which "means that compounds can be identified at very low concentrations (one part in 10^{12}) in chemically complex mixtures." A335.[7]

C. "Means . . . for Directing," "Means for Flowing," and "Means for Maintaining"

'736 Term	Claim	AB/Sciex's Proposal	Thermo's Proposal
"means . . . for directing said ions through said inlet orifice into said first chamber"	1	The corresponding structure, material, or acts described in the specification is either, or both, of two independent operating parameters: (1) the application of appropriate DC potential between the inlet orifice and the rod set in the first vacuum chamber; and/or (2) a difference in the pressures on either side of the inlet orifice.	The corresponding structures include "curtain gas plate 22," "orifice plate 28," and "rod set 32."

[7] "A__" refers to the Appendix to AB/Sciex's Opening Claim Construction Brief. D.I. 65 (C.A. No. 04-1230); D.I. 51 (C.A. No. 05-110).

'736 Term	Claim	AB/Sciex's Proposal	Thermo's Proposal
"means for maintaining the kinetic energies of ions moving from said inlet orifice to said first rod set at a relatively low level"	1	The corresponding structure, material, or acts described in the specification is the application of two variables: (1) a DC potential voltage between the inlet orifice and the first rod set, and (2) the pressure in the first vacuum chamber.	The corresponding structures include "curtain gas plate 22," "orifice plate 28," and "rod set 32."
"means for flowing gas through said inlet orifice into said first space"	1	The corresponding structure, material, or acts described in the specification is the existence of gas in a chamber, separated from the first vacuum chamber by the inlet orifice, at a higher pressure than that in the first vacuum chamber.	The corresponding structures include "curtain gas source 42," "duct 44 to the curtain gas chamber 24," "curtain gas chamber 24," "orifice plate 28," "orifice 26," "vacuum pump 31," and "vacuum chamber 30."

Thermo's identification of the corresponding structures in the specification that perform the recited functions of each of these "means-plus-function" limitations is flawed for several reasons which are discussed in the sections that follow. However, we address at the outset Thermo's principal criticism of the AB/Sciex's constructions, which the Court adopted in the Micromass litigation.

Thermo disputes that the DC voltages and pressure differentials disclosed in the specification can be corresponding structures, arguing that "[t]hese *things* are not structures at all, nor are they clearly linked by the specification to the claimed functions." Thermo Br. 36 (emphasis added). However, Thermo is unable to explain the operation of the system without invoking both of these "*things*" because they actually perform each of the recited functions. In fact, Thermo devotes two pages of its brief to explaining how both DC voltages and pressure differentials move ions downstream. Thermo Br. 6-7. Thermo argues that DC voltages and/or pressure differentials are not structures by presenting "the example" that the "application of appropriate DC potential" is not a structure but only "an injection of energy." Thermo Br. 37. Thermo's position is

contrary to the case law, which does not require that a structure be "hardware" to qualify under 35 U.S.C. § 112, ¶ 6. *See, e.g., Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1377 (Fed. Cir. 2003) (finding "the normal operating system on the computer, another automation operating system, a customized or a normal MBR ["Master Boot Record"], and communications software" each to be the corresponding structure); *Globetrotter Software, Inc. v. Elan Computer Group, Inc.*, 236 F.3d 1363, 1367-70 (Fed. Cir. 2001) (finding a software license file having unique identification data was the corresponding structure); *Fonar Corp. v. General Elec. Co.*, 107 F.3d 1543, 1551-52 (Fed. Cir. 1997) (finding a "generic gradient waveform" to be the corresponding structure). Thus, Thermo's sweeping position that only "hardware" can be a structure within the meaning of 35 U.S.C. § 112, ¶ 6 is legally incorrect.[8]

1. "Means . . . for Directing"

Thermo agrees that the recited function for the "means . . . for directing" element is "directing said ions through said inlet orifice into said vacuum chamber." D.I. 64, Ex. A at 4. However, Thermo then revises the recited function, stating that this element "concern[s] the means by which voltages are used to push ions into and through the ion guide chamber." Thermo Br. 36. This revision is incorrect for two reasons. First, it does not account for the fact that the pressure differential also directs the ions through the inlet orifice. Second, it includes directing ions "through the ion guide." The function is

[8] Thermo's conclusory assertion that AB/Sciex is "transforming" these means-plus-function limitations "into purely functional limitations" (Thermo Br. 37) is wrong. AB/Sciex is not contending that the claims cover any means for performing the recited functions. To the contrary, the '736 patent specification identifies the DC voltages and pressure differentials as the corresponding structures.

completed when the ions arrive in the "first vacuum chamber." The "means for . . . directing" does not extend to directing the ions "through the ion guide."

Instead of identifying the corresponding structures that actually perform the recited function – a DC voltage applied between the inlet orifice and the first rod set in the first vacuum chamber, and/or a difference in the pressures on either side of the inlet orifice – Thermo identifies "curtain gas plate 22," "orifice plate 28," and "rod set 32." *Id.* at 36. Thermo's proposed construction is incorrect for several reasons.

First, curtain gas plate 22 has nothing to do with directing ions through the inlet orifice. The specification describes a DC potential between curtain gas plate 22 and orifice plate 28 in Figure 1, but that potential directs ions through orifice 20, not inlet orifice 26. JA2. In Figure 12, curtain gas plate 22' is even further removed from inlet orifice 76 because vacuum chamber 70 is between curtain gas chamber 24' and chamber 30'. JA10. Thus, inclusion of the curtain gas plate is improper. *See Asyst Techs., Inc. v. Empak, Inc.*, 268 F.3d 1364, 1369-70 (Fed. Cir. 2001) ("Section 112, paragraph 6 does not 'permit incorporation of structure from the written description beyond that necessary to perform the claimed function.'" (citation omitted)).

Second, Thermo identifies orifice plate 28 and rod set 32 from the embodiment in Figure 1 as the corresponding structures, but fails to identify the analogous elements in the Figure 12 embodiment. In contrast, AB/Sciex's proposed construction properly embraces both embodiments in its identification of "the application of appropriate DC potential between the inlet orifice and the rod set in the first vacuum chamber." *See Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999) ("When multiple embodiments in the specification correspond to the claimed function,

proper application of § 112, ¶ 6 generally reads the claim element to embrace each of those embodiments."); *see also Versa Corp. v. Ag-Bag Int'l Ltd.*, 392 F.3d 1325, 1328-30 (Fed. Cir. 2004) (holding that the corresponding structure for a means-plus-function limitation was not limited to a particular structure because a non-preferred embodiment, where the function was nevertheless performed, lacked that structure).

Third, although a DC voltage is applied between orifice plate 28 and rod set 32, these elements themselves do not perform the recited function or the "pushing function" as identified by Thermo. Any such "pushing function," or more accurately, "directing said ions through said inlet orifice into said first vacuum chamber," is actually performed by the DC voltage and/or the difference in the pressures on either side of the inlet orifice. Thermo acknowledges that the DC voltage performs this function when it states with reference to orifice plate 28 and rod set 32 that "[t]hese are the structures *to which* the *DC voltages are applied so as to move the ions*." Thermo Br. 36 (emphasis added). Thermo also cites the following passage from the specification, which supports AB/Sciex, not Thermo:

> Ions produced in the ionization chamber 16 are *drifted by appropriate DC potentials* on plates 22, 28, and on the AC-only rod set 32 through opening 20 and orifice 26, and then are guided through the AC-only rod set 32 and interchamber orifice 34 into the rod set 40.

JA17, 4:38-42 (cited at Thermo Br. 36) (emphasis added). Section 112 requires that the corresponding structure is that which *actually performs* the recited function (*Asyst Techs.*, 268 F.3d at 1371), and the above passage makes clear that it is *the DC voltage* between the inlet orifice and the first rod set in the first vacuum chamber that directs ions through the inlet orifice into the first vacuum chamber, not the plate and the rods.

Fourth, Thermo omits the second corresponding structure disclosed in the specification, namely, a difference in the pressures on either side of the inlet orifice. The specification repeatedly discloses that pressure differentials exist between the first vacuum chamber and the preceding chambers, and that these differentials will direct ions, along with neutral gas molecules, to flow through the inlet orifice. *See* AB/Sciex Br. 21-22;[9] *see also Applera*, 186 F. Supp. 2d at 516-17 (JA514-15). Thermo simply ignores this disclosure by mischaracterizing the recited function as "the means by which *voltages* are used to push ions." Thermo Br. 36 (emphasis added).

Fifth, Thermo incorrectly argues that the Court in the Micromass case was never presented with the issue of whether the DC voltage between the inlet orifice and the rod set in the first vacuum chamber and the pressure differential on either side of the inlet orifice are corresponding structures under 35 U.S.C. § 112, ¶ 6. *Id.* at 38. This argument is incorrect on both counts.

Although the Court stated that the parties did not disagree that the DC voltage was one of the corresponding structures, the fact that the Court cited the passage from the '736 patent specification stating that the ions are "drifted by appropriate DC potentials," demonstrates that the Court considered the issue and agreed with the parties on this point. *Applera*, 186 F. Supp. 2d at 516 (JA514) (citing JA17, 4:38-41). Thus, the Court satisfied its independent duty to arrive at the correct construction regardless of what the parties proposed. *See Exxon Chem. Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555-56 (Fed. Cir. 1995) ("[T]he trial judge has an independent obligation to determine the meaning of the claims, notwithstanding the views asserted by the adversary parties.");

[9] "AB/Sciex Br. __" refers to AB/Sciex's Opening Claim Construction Brief. D.I. 55 (C.A. No. 04-1230); D.I. 44 (C.A. No. 05-110).

Novo Nordisk v. Eli Lilly & Co., No. 98-843, 1999 U.S. Dist. LEXIS 18690 at *45-47 (D. Del. Nov. 18, 1999) (construing the claim term "pharmaceutical" independently of the definitions proffered by the parties) (B52-53); *Schering Corp. v. Amgen Inc.*, 18 F. Supp. 2d 372, 381 (D. Del. 1998) ("[T]he Court is not limited to picking between definitions supplied by the parties.").

With respect to the pressure differential, Thermo ignores the Court's statement that "the structure is evident from the specification" (*Applera*, 186 F. Supp. 2d at 517 (JA515)), which makes clear that the Court considered whether the pressure differential could be a structure and concluded that it was.

Claim construction is a matter of law, and as such, the Court's prior construction should be given deference. *Markman v. Westview Instr., Inc.*, 517 U.S. 370, 391 (1996) (stating that *stare decisis* should promote uniformity in the claim construction of a given patent); *KX Indus. v. PUR Water Purification Prods., Inc.*, 108 F. Supp. 2d 380, 387 (D. Del. 2000), *aff'd*, 18 F.App'x 871 (Fed. Cir. 2001) ("[T]o the extent the parties do not raise new arguments, the court will defer to its previous construction of the claims.").

2. "Means for Maintaining"

Thermo also agrees that the recited function for the "means for maintaining" element is "maintaining the kinetic energy of ions moving from said inlet orifice to said rod set at a relatively low level." Once again, however, Thermo revises the function, stating that this element "concern[s] the means by which voltages are used to push ions into and through the ion guide chamber." Thermo Br. 36. This revision is inaccurate because it includes directing ions through the inlet orifice and through the chamber as part of the recited function. The element actually concerns ions moving only *from* the

inlet orifice *to* the rod set. Moreover, the "means for maintaining" relates to *the kinetic energy* of the ions, not merely moving ions.

Once again, instead of identifying the corresponding structures that actually perform the recited function, Thermo incorrectly identifies "curtain gas plate 22," "orifice plate 28," and "rod set 32" as the corresponding structures "which perform this pushing function." *Id.* Thermo's proposed construction is incorrect for several reasons.

First, curtain gas plate 22 is not involved in maintaining the kinetic energy of ions moving *from the inlet orifice to the first rod set* at a relatively low level. Nowhere in the specification is curtain gas plate 22 associated with the recited function. Also, in the Figure 12 embodiment, curtain gas plate 22' is even further removed from inlet orifice 76 because vacuum chamber 70 is between curtain gas chamber 24' and chamber 30'. JA10.

Second, while Thermo identifies orifice plate 28 and rod set 32 from the embodiment in Figure 1 as the corresponding structures for this means-plus-function limitation, Thermo fails to identify the analogous elements in the Figure 12 embodiment. On the other hand, AB/Sciex's proposed construction properly embraces both embodiments in its identification of "the application of two variables: (1) a DC potential voltage *between the inlet orifice and the first rod set*, and (2) the pressure in the first vacuum chamber." *See Micro Chem.*, 194 F.3d at 1258; *see also Versa*, 392 F.3d at 1328-30.

Third, although the DC voltage is applied between orifice plate 28 and rod set 32, these elements themselves do not actually perform any "pushing function" as Thermo contends. Thermo Br. 36. Together, the *DC voltage and the pressure* in the chamber perform the function of "maintaining the kinetic energy of ions moving from said inlet

orifice to said first rod set at a relatively low level." Thermo acknowledges that the DC voltage partially performs this function when it states with reference to curtain gas plate 22, orifice plate 28, and rod set 32, that "[t]hese are the structures to which the DC voltages are applied so as to move the ions." *Id.* Thermo also cites the following passage from the specification, even though this passage does not support Thermo:

> Ions produced in the ionization chamber 16 are drifted by appropriate DC potentials on plates 22, 28, and on the AC-only rod set 32 through opening 20 and orifice 26, and then are guided through the AC-only rod set 32 and interchamber orifice 34 into the rod set 40.

Id. (emphasis removed) (citing JA17, 4:38-42). This passage says nothing about maintaining the kinetic energy of ions moving from the inlet orifice to the first rod set at a relatively low level. Instead, it merely explains that a DC potential between orifice plate 28 and rod set 32 drifts ions through the orifice to rod set 32. The specification makes clear that maintaining the kinetic energy of the ions at a relatively low level is accomplished by the application of the appropriate voltage for a given pressure in the vacuum chamber. *See* AB/Sciex Br. 26.

Fourth, Thermo ignores the relationship between the DC voltage and the pressure in the first vacuum chamber. The kinetic energy of the ions depends on *both* (1) the DC voltage between the inlet orifice and the rod set, *and* (2) the pressure in the first vacuum chamber. In particular, to maintain ion kinetic energy at a relatively low level, the appropriate DC voltage depends upon the pressure in the vacuum chamber. *See id.*

Fifth, Thermo incorrectly argues that the Court in the Micromass case was never presented with the issue of whether the DC voltage between the inlet orifice and the first rod set and the pressure in the first vacuum chamber are corresponding structures under 35 U.S.C. § 112, ¶ 6. Thermo Br. 38. Micromass argued that the claims were indefinite

because the specification contained no structure that corresponded to the recited function. *Applera*, 186 F. Supp. 2d at 527 (JA525).[10] Micromass also presented a contingent position, namely, that if forced to assume that a structure exists in the specification, the corresponding structure is only the DC offset voltage applied between the inlet orifice and the first rod set. AB/Sciex argued in response, as it does now, that in light of the specification's discussion of the effects of pressure and voltage on kinetic energy, the structure for accomplishing the function was *both* voltage and pressure. The Court agreed with AB/Sciex:

> After careful consideration of the specification, the court agrees with AB/Sciex. As noted above, the patent specification repeatedly recites the effect of the pressure in the first vacuum chamber on the kinetic energy of ions entering it. Thus, the *structure . . . must be both voltage and pressure.*

Applera, 186 F. Supp. 2d at 527 (JA525) (emphasis added). The Court's statement that "the structure . . . must be both voltage and pressure" demonstrates that, in fact, the Court did consider the issue of whether the voltage and pressure could be a structure and concluded that they were, consistent with its independent duty to construe the claims irrespective of the parties' positions.

3. "Means for Flowing"

Thermo agrees that the recited function for the "means for flowing" element is "to flow gas through said inlet orifice and into said first space." Once again, however, Thermo then revises the function, stating that "[t]he 'means for flowing' limitation

[10] The Court had not yet denied Micromass's indefiniteness summary judgment motion at the time it issued its claim construction opinion and thus did not foreclose Micromass's invalidity arguments, *including* the argument that the voltage and pressure parameters are not a "structure" for the purposes of a means-plus-function limitation and that the specification does not "clearly link" a structure to the function. *See Applera*, 186 F. Supp. 2d at 527 (JA525). The Court ultimately denied Micromass's summary judgment motion, and at trial, the '736 patent was found to be valid and infringed. *See Applera*, 204 F. Supp. 2d 724 (JA529-589).

concerns flowing gas into the first chamber (*i.e.*, the ion guide chamber) for the ultimate purpose of creating a 'downstream' pressure differential." Thermo Br. 36. This statement is incorrect, because this limitation does not recite an "ultimate purpose" as Thermo contends.

Once again, instead of identifying the corresponding structure that actually performs the recited function, Thermo identifies the following elements from the Figure 1 embodiment: "curtain gas source 42," "duct 44 to the curtain gas chamber 24," "curtain gas chamber 24," "orifice plate 28," "orifice 26," "vacuum pump 31," and "vacuum chamber 30." *Id.* at 37. Once again, Thermo's proposed construction is incorrect for several reasons.

First, Thermo identifies elements in the Figure 1 embodiment that may be used to increase the pressure within curtain gas chamber 24. However, the elements identified by Thermo do not *actually perform* the recited function (causing gas to flow through the inlet orifice), as required by the case law. *Asyst Techs.*, 268 F.3d at 1371. In support of its incorrect proposed construction, Thermo quotes part of the specification that describes the Figure 1 embodiment:

> The curtain gas chamber 24 is connected by an orifice 26 in orifice plate 28 to a first vacuum chamber 30 pumped by a vacuum pump 31 . . . . An inert curtain gas, such as nitrogen, argon or carbon dioxide, is supplied via a curtain gas source 42 and duct 44 to the curtain gas chamber 24. (Dry air can also be used in some cases.) The curtain gas flows through orifice 26 into the first vacuum chamber 30 . . . .

Thermo Br. 37 (citing JA17, 4:19-21, 29-33). This passage describes the pressure differential between curtain gas chamber 24 and vacuum chamber 30 (resulting from "vacuum chamber 30 [being] pumped by a vacuum pump 31"), and explains that curtain gas flows through orifice 26 into the first vacuum chamber 30. However, the passage

does not *clearly link* the elements related to the curtain gas source with the recited function of flowing gas through the inlet orifice into the first space. It is the fact that the gas in the curtain gas chamber is at a higher pressure (approximately atmospheric pressure) than the first vacuum chamber (at "up to between 150 and 200 millitorr") that causes gas to flow through the inlet orifice. JA17, 4:13-15, 17-19; JA22, 13:65-66. Gas will flow when there is a pressure difference regardless of what causes the pressure difference. This principle is illustrated in the Figure 12 embodiment ignored by Thermo, which shows vacuum chamber 70 preceding the "first" vacuum chamber 30', and not a curtain gas chamber. JA20, 9:14-15. In that embodiment, it is the fact that *vacuum chamber 70* is at a higher pressure than vacuum chamber 30' that causes gas to flow through the inlet orifice, not, as Thermo contends, that the curtain gas elements cause gas to flow through the inlet orifice. *Asyst Techs.*, 268 F.3d at 1369-70 ("Structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." (citation omitted)).

Second, AB/Sciex's proposed construction properly embraces both disclosed embodiments in its identification of "the existence of gas in *a chamber, separated from the first vacuum chamber by the inlet orifice,* at a higher pressure than that in the first vacuum chamber." (emphasis added). Thermo's proposed construction fails to consider a preferred embodiment disclosed in the written description (the Figure 12 embodiment), and, therefore, should be rejected. *Micro Chem.*, 194 F.3d at 1258; *see also Versa*, 392 F.3d at 1328-1329.